

UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Utilities Service
Technical Standards Committee "A"

Supplement No. 2, January 2006, to
RUS Informational Publication 202-1,
List of Materials Acceptable for Use on
Systems of RUS Electrification Borrowers

The attached pages dated January 2006, for the "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December, 2005. They replace pages dated July 2005 and October 2005. The following changes should be made in order to keep RUS Informational Publication 202-1 up to date.

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a - Insulator, pin type

ANSI Class	55-2	55-3	55-4
Application	5 kV	12.5/7.2 kV and 13.2/7.62 kV systems	12.5/7.2 kV and 13.2/7.62 kV systems (where greater insulation is needed)
Pinhole diameter	1 in.	1 in.	1 in.
ICB	ICB 552	ICB 553	ICB 554
Porcelain Products (Knox) ²	253	261-S	366-S
Victor Insulators, Inc.	8	5, VI 605R	6, VI 606R
ANSI Class	56-1	56-3	56-4
Application	24.9/14.4 kV distribution lines	33 - 34.5 kV transmission lines	44 - 46 kV transmission lines
Pinhole diameter	1-3/8 in. Metal thimble (unless noted)	1-3/8 in. Metal thimble	1-3/8 in. Metal thimble
ICB	ICB 561	-	-
Porcelain Products (Knox)	-	2045-S	-
Victor Insulators, Inc.	27-R ¹ , VI 627R	245-R, VI 645R	255-R

¹Does not have a metal thimble.

²ANSI class 55-2, 55-3, and 55-4 pin insulators manufactured at both the Knoxville and Macomb plants are acceptable.

k - Insulators, suspension

ANSI Class Type	52-9A Clevis	52-1 Clevis	52-4 Clevis	52-3 Ball & Socket
Disc Diameter	4-1/4"	6"	9" or 9-1/2"	9" or 9-1/2"
M & E Rating, lbs.	10,000	10,000	15,000	15,000
Leakage	6-3/4"	7"	11-1/2"	11-1/2"
Flashover, kV: Dry	60	60	80	80
Flashover, kV: Wet	30	30	50	50
NOTES	(3) (4)	(3) (4)	(5)	(2)

Manufacturer	Catalog Number			
ICB	ICB 529-A	ICB 521	-	-
Lapp	-	-	9100	9000
Locke	16044	16583	15S410	15S409
Sediver	CT-4R2-M	-	-	-
Victor Insulators, Inc.	817	804	-	-

ANSI Class Type	52-3 Ball & Socket	52-4 Clevis	52-5 Ball & Socket	52-6 Clevis
Disc Diameter	10"	10"	10"	10"
M & E Rating, lbs.	15,000	15,000	25,000	25,000
Leakage	11-1/2"	11-1/2"	11"	11"
Flashover, kV: Dry	80	80	80	80
Flashover, kV: Wet	50	50	50	50
NOTES	(2)	(1)	(2)	-

Manufacturer	Catalog Number			
GEC Alsthom	-	105452	-	-
Lapp	8200	8100	301425	2300
Locke	-	20S580	-	30S257
Porcelain Prod. (Knox)	81022	81012	-	-
Sediver	-	CT-8R2	-	-

Notes:

- (1) Use two for 24.9/14.4 kV deadends.
- (2) To be used only on transmission lines.
- (3) To be used only on distribution lines.
- (4) Use two insulators for 12.5/7.2 kV deadends and three for 24.9/14.4 kV deadends.
- (5) Use two insulators for 24.9/14.4 kV deadends.

ap - Clamp, hot line
Copper and Copperweld-copper Conductor
(Clamps with internal springs and enclosed threads)

Conductor	
Copper	6 thru 2/0
Copperweld-copper	8A thru 2A
Blackburn	HLC 2108
Electric Motion Company	EM HLC-101
H-J Enterprises	UBBC20-001
Hubbell (Anderson)	BC-2/0
Hubbell (Chance)	S1520CC
Hubbell (Fargo)	GH-100S
	GH-201 (For use with CL Fuse)
Ideal	3532
MacLean (Reliable)	C1520
Penn-Union	HLC-020-LS

ap - Clamp, hot line
ACSR with armor rods

Clamps listed below have spring action and enclosed thread chambers.

Conductor Size		4/0 & 3/0	2/0	1/0 & 2	4
	Tap Conductor				
Connector Mfg.	Aluminum	HL 4/0	-	-	-
H-J Enterprises	Aluminum	-	UBBC30-001	UBBC30-001	UBBC30-001
	Copper	-	UBBC30-001TP	UBBC30-001TP	UBBC30-001TP
Hubbell (Anderson)	Aluminum	AC-800	AH-4	AH-4	AH-4
	Copper	AC-800-GP	AH-4-GP	AH-4-GP	AH-4-GP
Hubbell (Chance)	Aluminum	S1540-AA	S1540-AA	S1530-AA	S1530-AA
	Copper	S1540-AC	S1540-AC	S1530-AC	S1530-AC
Hubbell (Fargo)	Aluminum	GH-202AL	GH-202AL	GH-101A	GH-101A
	Copper	GH-102AC	GH-102AC	GH-101AC	GH-101AC
MacLean (Reliable)	Aluminum	-	-	C1530A	C1530A
	Copper	-	-	C1530A	C1530A
Penn Union	Aluminum	-	-	HLCA-040	HLCA-040
	Copper	-	-	HLCA-040	HLCA-040
Utilco	Aluminum	-	HLC-397	-	HLC-40

av - Conductor, ACSR

Applicable Specification: ASTM Specification B 232

Preferred Sizes:

<u>Distribution</u>	<u>Transmission</u>
4 - 6/1	1/0 - 6/1
4 - 7/1	2/0 - 6/1
2 - 6/1	3/0 - 6/1
2 - 7/1	4/0 - 6/1
1/0 - 6/1	266.8 kcmil - 26/7
2/0 - 6/1	336.4 kcmil - 26/7
3/0 - 6/1	477 kcmil - 26/7
4/0 - 6/1	556.5 kcmil - 26/7
266.8 kcmil 18/1	795 kcmil - 26/7
336.4 kcmil 18/1	954 kcmil - 54/7
477 kcmil 18/1	

NOTE: Larger sizes may be used where the engineer's study shows they are required.

The following manufacturers have shown compliance with the applicable specifications:

Alcan Cable
Conductores Monterrey S.A. de C.V.
Condumex
General Cable
Kobrex S.A. de C.V.
Nehring
Nexans Canada
Nexans Korea
Noranda
Prysmian
Southwire
Taihan Electric Wire

NOTES

1. Conductors with 18/1 stranding have different sag characteristics than conductors with 6/1 or 26/7 stranding. This difference in sag characteristics must be taken into consideration in the line design.
2. 266.8 kcmil 26/7, 336.4 kcmil 26/7, and 477 kcmil 26/7 may be used for distribution underbuild on transmission lines.

av - Conductor, Service
(Single Conductor)

Manufacturer	Aluminum	Copper
Alcan Cable	x	-
Conductores Monterrey	x	-
Condumex	x	x
General Cable	x	x
Nehring	x	-
Nexans Canada	x	-
Prysmian	x	x
Rome Cable	x	x
Southwire	x	x

Applicable Specification: ICEA-NEMA Standard S-66-524

Insulation: Cross-linked thermosetting polyethylene or equal.

Conductor: MHD copper or HD (Aluminum 1350) aluminum (Compact or compressed stranded conductor is acceptable.)

Marking: Manufacturer's name and type of insulation shall be clearly shown in durable markings on the surface of the insulation at intervals no greater than 24 inches.

av - Conductor, Service Cable
(Triplex and Quadruplex)

Manufacturer	Aluminum	Copper
Alcan Cable	x	-
Conductores Monterrey	x	-
Condumex	x	x
General Cable	x	x
Hendrix	x	x
Nehring	x	-
Nexans Canada	x	-
Prysmian	x	x
Rome Cable	x	x
Service Wire	-	x
Southwire	x	x

Applicable Specifications: RUS Specification D-2, Specifications for 600 Volt Neutral-Supported
Secondary Service Drop Cables.

av - conductor

Manufacturer	Conditions
<u>Alcan Cable</u> Duplex type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
<u>Copperweld Southern</u> Alumoweld-aluminum 6/1 ACSR/AW, 2, 1/0, 2/0, 4/0 4/3 AWAC, 4, 2, 1/0	1. To obtain experience.
<u>General Cable</u> T-2 type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
ACSR/TW, ACSS or ACSS/TW conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Indicate type of steel core wire and class (if applicable) of coating.
<u>Nexans Canada</u> ACSR-II (T-2) type, with ACSR conductors using preferred conductor sizes	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
<u>Southwire</u> VR type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
<u>Viakon</u> Type ACSS, using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations. 3. Indicate type of steel core wire and class (if applicable) of coating.

by - Deadend, automatic and formed Type

<u>Conductor Size</u>			
<u>Cu</u>	<u>CWC</u>	<u>Hubbell (Fargo)</u>	<u>Maclean (Reliable)</u>
-	4A	GD-515	27-SDS
-	6A	GD-513	47-SDS
-	8A	GD-512	-
2 x 3	-	GD-515	271
4	-	GD-512	41LD
6	-	GD-511	61LD

ACSR

*Blackburn	ATD Series
*Dulmison	AWDG-0805, 0990, and 1135
*Hubbell (Fargo)	GD-400 Series
*MacLean (Reliable)	7650 Series
*Preformed	DG Series
	#OHDE-9534 thru 9540, 4577

#May only be used with a spool insulator (Item cm) and appropriate clevis for neutral and secondary applications.

*For use on conductors 4/0 and smaller only.

Aluminum Alloy (6201 and 5005)

Blackburn	ATD Series
Hubbell (Fargo)	GD-A Series
MacLean (Reliable)	AL Series
Preformed	DG Series

cm - Insulator, Spool

Type:	<u>Secondary (Wet Process)</u>		<u>Service</u>	
			<u>Wet Process</u>	<u>Dry Process</u>
Groove Diameter:	<u>1-3/4"</u>	<u>3"</u>	<u>1-3/8"</u>	<u>1-3/8"</u>
ANSI Class	53-2	53-4	53-1	NA
Cooper Power Systems	DE4S3	DE5S3	DE2S2	DE2S1
Hughes	2102	-	-	-
ICB	ICB 532	ICB 534	ICB 531	-
Joslyn	-	J0101A	J150A	J100A
Kortick	K516	K522	K513	K514
MacLean (Continental)	U205	U31221	U208	U207
Porcelain Products (Knox)	5101	5119	5107	5207
Universal	1082	-	-	-
Victor Insulators, Inc.	2012, VI 2612	2026, VI 2626	2011, VI2611	-

U gu - Power Pedestal
(Below-Grade)
Refer to Drawings UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Malton</u>	Fiberglass secondary pedestal FSP31139, FSP301515
<u>Pen-Cell</u>	PE Series-High Density Polyethylene (HDPE) base;lid available in HDPE, fiberglass, aluminum, or stainless steel;PEM Series with modular construction
<u>Quazite</u>	Power Pedestal – PV, Boxes - PX/PE Series, PR/LR Series, PC, PG, LG Series
<u>Synertech Moulded Products</u>	S1212, S1118, S1324, S1730, S2436, S3048 and S3660
<u>Thermodynamics</u>	PP91, PP92, PP94, PP96, PP97, PP98, PP03, PPV91, TEV132415ASY and TEV121612ASY series

U hp - Terminations, Elbow
(rated for switching on three-phase systems)

(When ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

Manufacturer	Catalog Number
<u>Cooper Power Systems</u>	15 kV, Loadbreak SBT IV LE215T Series with test point LE215 Series without test point 25 kV, Loadbreak SBT LE225T Series with test point LE225 Series without test point
<u>Thomas & Betts (Elastimold)</u>	15 kV loadbreak Style 165LR Series, without voltage test point Style 166LR Series, with voltage test point Style 165LRJS Series, without voltage test point, with integral jacket seal Style 166LRJS Series, with voltage test point, with integral jacket seal 25 kV loadbreak Style 275LR Series, without voltage test point Style 276LR Series, with voltage test point Style 275LRJS Series, without voltage test point, with integral jacket seal Style 276LRJS Series, with voltage test point, with integral jacket seal 35 kV loadbreak Style 375LR Series, without voltage test point Style 376LR Series, with voltage test point
<u>Hubbell (Chardon)</u>	15 kV, Loadbreak 9U01A--6--Series 25 kV, Loadbreak 9U01B--5--Series

U hv - Cable, Underground
15 kV and 25 kV Cable

Applicable Specification:

Conductor (15 kV):

Conductor (25 kV):

Insulation:

RUS Specification U-1

Copper or Aluminum - #2 AWG through 1000 kcmil

Copper or Aluminum - #1 AWG through 1000 kcmil

Crosslinked Polyethylene (XLP)

(a) indicates Union Carbide 4201 XLP

(b) indicates BP 521 XLP

Tree-retardant Crosslinked Polyethylene (XLP-TR)

(1) indicates Union Carbide 4202 XLP-TR

(2) indicates BP H119Y XLP-TR

(3) indicates BP H118Y XLP-TR

Ethylene Propylene Rubber (EPR)

Neutral:

Copper Concentric Neutral

Jacket:

High Molecular Weight Polyethylene

Manufacturer	Insulation(s)	Flat Strap Neutral Available
Conductores Monterrey, S.A. de C.V.	XLP (a), XLP-TR (1), EPR	No
Conduemex	XLP (a), XLP-TR (1), EPR	No
General Cable	XLP (a,b), XLP-TR (1,3), EPR	Yes
Hendrix	XLP (a), XLP-TR (1, 2, 3), EPR	No
Hubbell (Kerite)	EPR	Yes
Nexans Canada	XLP (a), XLP-TR (1), EPR	No
Nexans Italia	EPR	No
Okonite	XLP (a), XLP-TR (1), EPR	Yes
Prysmian	XLP (a), XLP-TR (1), EPR	Yes
Rome	XLP (a), XLP-TR (1), EPR	Yes
Southwire	XLP (a), XLP-TR (1), EPR	No

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: RUS Specification U-2

Conductor: Copper, #4 AWG and larger; Aluminum, #2 AWG and larger

Insulation: Cross-Linked polyethylene (XLPE)

<u>Manufacturer</u>	<u>Type Conductor</u>
Alcan	Aluminum
Conductorres Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
Essex	Copper
General Cable	Copper or Aluminum
Nexans Canada	Aluminum
Okonite	Copper or Aluminum
Prysmian	Copper or Aluminum
Rome Cable	Copper or Aluminum
Service Wire Company	Copper
Southwire	Copper or Aluminum

NOTE: The manufacturers shown above have indicated that their 600 volt cable is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: RUS Specification U-2

Conductor: Copper, #4 AWG and larger; Aluminum, #2 AWG and larger

Insulation: Cross-Linked polyethylene (XLPE)

Cable Configuration: 3 Insulated Conductors Triplexed

<u>Manufacturer</u>	<u>Type Conductor</u>
Alcan	Aluminum
Conductores Monterrey, S.A. de C.V.	Copper or Aluminum
Condumex	Copper or Aluminum
General Cable	Copper or Aluminum
Nexans Canada	Aluminum
Okonite	Copper or Aluminum
Prysmian	Copper or Aluminum
Rome Cable	Copper or Aluminum
Southwire	Copper or Aluminum

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground
15 kV and 25 kV Cable

(Alternative Insulation Compound)

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Tree-retardant Crosslinked Polyethylene (XLP-TR) (I) indicates Pirelli IE.7100 XLP-TR (II) indicates AT Plastic PowerGuard 320TR (III) indicates Union Carbide HFDB-4202 (IV) indicates Nova Borealis LE 4212 (V) indicates Dow HFDB 8202
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene
Conditions:	To obtain experience

<u>Manufacturer</u>	<u>Insulation(s)</u>	<u>Flat Strap Neutral Available</u>
General Cable	XLP-TR (II, III, IV, V)	Yes
Hendrix	XLP-TR (III, IV)	No
Nexans Canada	XLP-TR (II, III, IV)	No
Prysmian	XLP-TR (I, IV)	Yes
Southwire	XLP-TR (III, IV)	No

U hv - Cable, Underground

600 Volt Cable

(Alternative Cable Constructions)

Applicable Specification: RUS Specification U-2 (except as indicated below)

NOTE: Manufacturers listed below are conditionally accepted for alternatives A, B, C, and/or D for the products listed on pages U hv-2 and U hv-3.

Alternative A: 8000 series aluminum alloy in accordance with ASTM B800 or B801.

Alternative B: Stranding in accordance with ASTM B786 for aluminum 1350 conductors or ASTM B787 for copper conductors.

Alternative C: Abuse resistant (ruggedized) (single or two layer) insulation in accordance with ICEA S-81-570.

Alternative D: Self-healing

Alternative E: Stranding in accordance with ASTM B 901 for Compressed Round Stranded Aluminum Conductors Using Single Input Wire Construction

Condition: To obtain experience.

<u>Manufacturer</u>	<u>Alternative</u>
Alcan	(A) (C)
BICC	(A) (C)
Prysmian	(A) (C) (D)
Nexans	(C)
Southwire	(A) (B) (C) (D) (E)

U hy - Splice, Underground, Permanent

(when ordering, specify conductor size, type, whether copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Catalog Number</u>
<u>Cooper Power Systems</u>	<u>15 kV and 25 kV</u> EZ II straight and transition splice #3 through 4/0 <u>35 kV</u> 2603934B Series straight splice
<u>Elastimold (ESNA)</u>	<u>15 kv</u> Style 1500S, straight splice, through #1/0 Style 25-S, straight splice, 2/0 through 4/0 Style I5PCJ-1, straight splice, through 4/0 Style 25-Y, Y-splice <u>25 kV</u> Style K-25-S, straight splice Style K-25-Y, Y-splice Style 25PCJ-1, straight splice, through 4/0 <u>35 kV</u> Style M-250-S, straight splice
<u>DSG-Canusa</u>	<u>15 kV</u> CJ 10 Series, heat shrinkable joints <u>25 kV</u> CJ 10 Series, heat shrinkable joints <u>35kV</u> CJ 10 Series, heat shrinkable joints
<u>Hubbell (Chardon)</u>	<u>15 kV</u> Straight Splice through #1/0, Model 9U16A-100 "Uni-Matic" Through #2/0, Model 9U06A <u>25 kV</u> "Uni-Matic" Through #2/0, Model 9U06A
<u>Prysmian</u>	<u>15 kV and 25 kV</u> "Elaspeed" style EPJMe straight splice, #2 through 1000 kcmil
<u>3M</u>	<u>(15, 25, 35 kV)</u> 5400 Series Quick Splice/Quick Splice II/Quick Splice III, 15 kV 5411R cable repair splice 5411R/HSJ-I cable repair splice (for jacketed cable)